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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,220	07/14/2005	Kengo Nagata	6268-003/NP	1747

27572 7590 03/03/2009

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER	
LOO, JUVENA W	

ART UNIT	PAPER NUMBER
2416	

MAIL DATE	DELIVERY MODE
03/03/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,220	NAGATA ET AL.	
	Examiner	Art Unit	
	JUVENA LOO	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,13,14 and 17-27* is/are rejected.

7)☒ Claim(s) *11,12,15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 – 18, 19 - 24, and 26 – 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particular point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the term "STA" is not defined.

3. Claims 6, 7, 13, 14, 16, 17, 19, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particular point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the term "MIMO" is not defined.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1).

Regarding claim 1, *a wireless packet communication method transmitting a data packet between two STAs that use plural radio channels, by using a radio channel* (Souisse: see "The present invention…independent networks" in Abstract), c*haracterized by*:

transmitting plural data packets simultaneously from one STA to another STA using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the features comprising:

a radio channel that is judged idle by carrier sensing;

when it is detected by said carrier sensing that plural radio channels are idle at the same time.

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

Regarding claim 2, *a wireless packet communication method transmitting a data packet between two STAs that use using plural radio channels, by using a radio channel* (Souisse: see "The present invention…independent networks" in Abstract), *characterized by*:

generating plural data packets having a same packet time length (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046); *and*

transmitting plural data packets having the same packet time length simultaneously from one STA to another STA using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section

0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the features comprising:

a radio channel that is judged idle by carrier sensing;

when it is detected by said carrier sensing that plural radio channels are idle at the same time.

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

Regarding claim 3, *a wireless packet communication method transmitting a data packet between two STAs that use plural radio channels and setting transmission rates for respective radio channels, by using a radio channel* (Souisse: see "The present invention…independent networks" in Abstract), *characterized by*:

generating plural data packets having a same packet time length in accordance with transmission rates of plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046); *and*

transmitting plural data packets having the same packet time length simultaneously from one STA to another STA using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the features comprising:

a radio channel that is judged idle by carrier sensing;

when it is detected by said carrier sensing that plural radio channels are idle at the same time.

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

6. Claims 4, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Okawa et al. (US 6,842,442 B2).

Regarding claim 4, a wireless packet communication method transmitting a data packet between two STAs that use using plural radio channels and setting transmission rates for respective radio channels, by using a radio channel (Souisse: see "The present invention…independent networks" in Abstract), *characterized by*:

generating plural data packets having a same packet time length (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046); *and*

transmitting plural data packets having the same packet time length simultaneously from one STA to another STA using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the features comprising:

a radio channel that is judged idle by carrier sensing;

setting transmission rates of plural idle radio channels to a same transmission rate;

when it is detected by said carrier sensing that plural radio channels are idle at the same time.

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

Okawa discloses a DS-CDMA transmission method comprising the feature:

setting transmission rates of plural idle radio channels to a same transmission rate (Okawa: see "the spreading is performed such that the transmission signal is transmitted at the same transmission rate over each of said plurality of code channels" in column 10, claim 2);

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Okawa, in order to implement high bit rate signal transmission (Okawa: see column 1, lines 49 – 52).

Regarding claim 9, *characterized in that*:

while said STA itself is performing a transmission on at least one radio channel (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046),

said STA defers any transmission process including carrier sensing until completion of said transmission (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

Regarding claim 10, characterized in that:

said STA simultaneously transmits data packets generated from all transmission-standby data frames when a number of transmission-standby data frames is smaller than or equal to a number of idle channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously); *and*

said STA generates and simultaneously transmits a same number of data packets as the idle radio channels when the number of transmission-standby data frames exceeds the number of idle radio channels (Souisse: see Figure 4 and "FIG. 4

shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Okawa et al. (US 6,842,442 B2) and further in view of Miyoshi et al. (US 2003/0022629 A1).

Regarding claim 5, *characterized by:*

setting said transmission rates of said plural idle radio channels equal to a lowest one of said transmission rates (Miyoshi: see "In the radio resource…selection method" in page 11, section 0164).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse, Benveniste, and Okawa by using the features, as taught by Miyoshi, in order to make the transmission possible for all communication channels/terminals (Miyoshi: see page 11, section 0164).

8. Claims 6, 7, 13, 14, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Okawa et al. (US 6,842,442 B2) and Mody et al. (US 2002/0181509 A1).

Regarding claim 6, *a wireless packet communication method transmitting a data packet between two STAs, by using a radio channel* (Souisse: see "The present invention…independent networks" in Abstract), *characterized by*:

generating plural data packets having a same packet time length (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046); *and*

However, Souisse does not explicitly disclose the features comprising:

transmitting between two STAs that use MIMO;

a radio channel that is judged idle by carrier sensing;

setting transmission rates of plural idle radio channels to a same transmission rate;

when it is detected by said carrier sensing that plural radio channels are idle at the same time.

transmitting plural data packets having the same packet time length simultaneously from one STA to another STA using one idle radio channel and said MIMO.

Mody et al. discloses a communication system comprising the feature:

transmitting between two STAs that use MIMO (Mody: see "In a communication system…offset correction" in Abstract).

transmitting plural data packets having the same packet time length simultaneously from one STA to another STA using one idle radio channel (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046) *and said MIMO* (Mody: see "In a communication system…offset correction" in Abstract).

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1).

Okawa discloses a DS-CDMA transmission method comprising the feature:

setting transmission rates of plural idle radio channels to a same transmission rate (Okawa: see "the spreading is performed such that the transmission signal is transmitted at the same transmission rate over each of said plurality of code channels" in column 10, claim 2);

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Mody, in order to increase the capacity of transmitted and received data while generally using the same amount of bandwidth as in a system with one transmit and one receive antenna (Mody: see page 1, section 0005).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Okawa, in order to implement high bit rate signal transmission (Okawa: see column 1, lines 49 – 52).

Regarding claim 7, *characterized by*:

transmitting plural data packets having a same packet time length simultaneously from one STA to another STA using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046) and said MIMO (Mody: see "In a communication system…offset correction" in Abstract), *the plural data packets being in a number that is equal to a sum of MIMO numbers of plural respective radio channels* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; Mody: see "In a communication system…offset correction" in Abstract; Souisse discloses sending message fragments over multiple channels/networks that are available and Mody discloses transmitting data in a MIMO system), *and said STAs capable of using plural radio channels and MIMO together* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; Mody: see "In a communication system…offset correction" in Abstract; Souisse discloses sending message fragments over multiple channels/networks that are available and Mody discloses transmitting data in a MIMO system).

Regarding claim 13, *characterized in that*:

said STA simultaneously transmits data packets generated from all transmission-standby data frames when a number of transmission-standby data frames is smaller than or equal to a MIMO number (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously); and

said STA generates and simultaneously transmits a same number of data packets as said MIMO number when the number of transmission-standby data frames exceeds said MIMO number (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously).

Regarding claim 14, *characterized in that*:

said STA simultaneously transmits data packets generated from all transmission-standby data frames when the number of transmission-standby data frames is smaller than or equal to the number of simultaneous transmissions, the number of simultaneous transmission being said sum of said MIMO numbers of said plural respective radio

channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously); *and*

generates and simultaneously transmits a same number of data packets as said number of simultaneous transmissions when the number of transmission-standby data frames exceeds said number of simultaneous transmissions (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; fragmented packets/frames are transmitted on various available channels/network simultaneously).

Regarding claim 27, *characterized in that*:

while said STA itself is performing a transmission on at least one radio channel (Benveniste: see "Channel Slotting…per super-frame" in page 5, sections 0053 – 0058), *said STA defers any transmission process including carrier sensing until completion of said transmission* (Benveniste: see "Channel Slotting…per super-frame" in page 5, sections 0053 – 0058).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Okawa et al. (US 6,842,442 B2) and further in view of Chang et al. (US 2004/0114506 A1).

Regarding claim 8, *characterized in that*:

while said STA itself is performing a transmission on at least one radio channel (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the feature comprising:

said STA selects, from idle radio channels, a radio channel or channels that is not influenced from leakage power from said radio channel being used for said transmission.

Chang et al. discloses a transmitting and receiving method comprising the feature:

said STA selects, from idle radio channels, a radio channel or channels that is not influenced from leakage power from said radio channel being used for said transmission (Chang: see "The step (b)…power leakage value" in page 1, section 0011).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse, Benveniste, and Okawa by using the features, as taught by Chang, in order to assign a weight value to each transmit data of the respective sub-channels (Chang: see page 1, section 0010).

10. Claims 17 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Okawa et al. (US 6,842,442 B2) and Mody et al. (US 2002/0181509 A1) and further in view of Chang et al. (US 2004/0114506 A1).

Regarding claim 17, *characterized in that*:

said STA selects one of a first mode in which a single radio channel is used and MIMO is not used (Chang: see page 7, section 0084; SISO OFDM system), *a second mode in which a single radio channel and MIMO are used* (Chang: see Figure 11; see also page 12, claim 12 and page 13, claim 18), *a third mode in which plural radio channels are used and MIMO is not used* (Chang: see Figure 9), *and a fourth mode in which plural radio channels and MIMO are used* (Chang: see Figure 12), *the selecting by the STA done according to at least one of the number of idle channels, a MIMO number of each radio channel, and a number of transmission-standby data frames* (Chang: see "It is an object…b the pilot signals" in page 1, sections 0008 – 0015).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse, Benveniste, Okawa, and Mody. by using the features, as taught by Chang, in order to provide a transmitting method for an OFDM system using at least one antenna (Chang: see page 1, section 0010).

Regarding claim 26, *characterized in that*:

while said STA itself is performing a transmission on at least one radio channel, said STA selects, from idle radio channels, a radio channel or channels that is not influenced from leakage power from said radio channel being used for said transmission (Chang: see "It is an object…b the pilot signals" in page 1, sections 0008 – 0015).

11. Claims 18 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Kasami et al. (US 2002/0181492 A1).

Regarding claim 18, *a wireless packet communication apparatus for transmitting a data packet between two STAs capable of using plural radio channels, by using a*

radio channel (Souisse: see "The present invention…independent networks" in Abstract, *characterized in that it comprises*:

data packet generating block that extracts a data region or regions from one or plural received data frames, generates plural data blocks having a same packet time length, and generates data packets by adding necessary header information to said data blocks (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046);

packet switching block that correlates said data packets generated by said data packet generating block with radio channels to be used for transmission, respectively (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046); *and*

data frame management block that determines one or plural data frames from which to generate data packets on the basis of pieces of information relating to respective data frames that are communicated from said transmission buffer block and information relating to radio channels that is communicated from said channels' occupation status analyzing block (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046), *and the data frame management block determines a method to generate plural data packets from one or plural data frames in accordance with the number of idle radio channels*

(Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046), *determines radio channels on which to transmit said plural generated data packets* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046), *gives said transmission buffer block designation of a data frame or frames to be output* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046), *informs said data packet generating block of a method generating data packets from one or plural data frames that are output from said transmission buffer block, and communicates, to said packet switching block, information that is necessary for correlating said data packets with said radio channels* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046), *said wireless packet communication apparatus further characterized in that*

plural data packets are transmitted simultaneously from one STA to another STA by using plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

However, Souisse does not explicitly disclose the features comprising:

a radio channel that is judged idle by carrier sensing;

channels' occupation status analyzing block that acquires pieces of idle state judgment information of a predetermined plural number of respective radio channels;

transmission buffer block that temporarily holds data frames to be transmitted, holds information regarding stored data packets that correlates address information of data frames it holds with packet sizes, and reads out and outputs a requested data packet when receiving a packet sending request;

Benveniste discloses a method for avoiding interference comprising the features:

a radio channel that is judged idle by carrier sensing (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1);

channels' occupation status analyzing block that acquires pieces of idle state judgment information of a predetermined plural number of respective radio channels (Benveniste: see "Channel Slotting…per super-frame" in page 5, sections 0053 – 0058);

Kasami et al. discloses a wireless communication apparatus comprising the feature:

transmission buffer block that temporarily holds data frames to be transmitted (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page

3, section 0038 through page 4, section 0041; see also Figure 7 and “FIG. 7 depicts the…into the system” in page 4, section 0044 – 0046), *holds information regarding stored data packets that correlates address information of data frames it holds with packet sizes, and reads out and outputs a requested data packet when receiving a packet sending request* (see Figure 8 and "FIG. 8 shows a circuit...same time" in page 6, sections 0088 - 0091; see also Figures 12 and 14 and "The wireless communication system…are finished” in page 9, section 0125 – 0131; see also Figures 15 (A and B), 16 (A, B, and C) and 17; see also “Now, procedures for transmitting/receiving…from the station 4-2.” In page 9, section 0132 through page 10, section 0137).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Benveniste, in order to help avoid interference between channels as it causes conflicting transmissions to occur at different times (Benveniste: page 3, section 0035).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse et al. by using the features, as taught by Kasami, in order to provide a procedure for transmitting and receiving packets in a system (Kasami: see page 6, section 0088).

Regarding claim 19, *characterized in that it further comprises*:

a MIMO block that transmits plural independent signals simultaneously on said respective radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046; Mody: see "In a communication system…offset correction" in Abstract).

Regarding claim 20, *characterized in that*:

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1),

said data frame management block performs a control to generate plural data packets having a same packet time length from one or plural data frames (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

12. Claims 21, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Kasami et al. (US 2002/0181492 A1) and further in view of Okawa et al. (US 6,842,442 B2).

Regarding claim 21, *characterized in that*:

said two STAs include means capable of setting transmission rates for respective radio channels (Okawa: see "the spreading is performed such that the transmission signal is transmitted at the same transmission rate over each of said plurality of code channels" in column 10, claim 2); *and*

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1),

said data frame management block performs a control to generate plural data packets having a same packet time length from one or plural data frames, in accordance with transmission rates of plural idle radio channels (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

Regarding claim 22, *characterized in that*:

said two STAs include means capable of setting transmission rates for respective radio channels (Okawa: see "the spreading is performed such that the transmission signal is transmitted at the same transmission rate over each of said plurality of code channels" in column 10, claim 2); *and*

when it is detected by said carrier sensing that plural radio channels are idle at the same time (Benveniste: see "said nodes transmitting only when the channel is idle according to any medium access protocol based on carrier sensing" in page 6, claim 1),

said data frame management block performs a control to set transmission rates of plural idle radio channels to a same transmission rate (Okawa: see "the spreading is performed such that the transmission signal is transmitted at the same transmission rate over each of said plurality of code channels" in column 10, claim 2) *and to generate plural data packets having the same packet time length from one or plural data frames* (Souisse: see Figure 4 and "FIG. 4 shows a flow chart…hardware capabilities" in page 3, section 0038 through page 4, section 0041; see also Figure 7 and "FIG. 7 depicts the…into the system" in page 4, section 0044 – 0046).

Regarding claim 24, *characterized in that it further comprises*:

while an own station is performing a transmission on at least one radio channel (Benveniste: see "Channel Slotting…per super-frame" in page 5, sections 0053 – 0058),

means to prohibit any transmission process including carrier sensing until completion of said transmission (Benveniste: see "Channel Slotting…per super-frame" in page 5, sections 0053 – 0058).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse, Benveniste, and Kasami by using the

features, as taught by Okawa, in order to implement high bit rate signal transmission (Okawa: see column 1, lines 49 – 52).

13. Claims 23 and 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Souisse et al. (US 2002/0102987 A1) in view of Benveniste (US 2003/0086437 A1) and Kasami et al. (US 2002/0181492 A1) and further in view of Chang et al. (US 2004/0114506 A1).

Regarding claim 23, *characterized in that it further comprises*:

while an own station is performing a transmission on at least one radio channel, means to select, from idle radio channels, a radio channel or channels that is not influenced by leakage power from said radio channel being used for said transmission (Chang: see "It is an object…b the pilot signals" in page 1, sections 0008 – 0015).

Regarding claim 25, *characterized in that*:

said data frame management block includes means that selects one of a first mode in which a single radio channel is used and MIMO is not used (Chang: see page 7, section 0084; SISO OFDM system), *a second mode in which a single radio channel and MIMO are used* (Chang: see Figure 11; see also page 12, claim 12 and page 13, claim 18), *a third mode in which plural radio channels are used and MIMO is not used*

(Chang: see Figure 9), *and a fourth mode in which plural radio channels and MIMO are used* (Chang: see Figure 12), *the selecting by the means done according to at least one of the number of idle channels, a MIMO number of each radio channel, and the number of transmission-standby data frames* (Chang: see "It is an object…b the pilot signals" in page 1, sections 0008 – 0015).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Souisse, Benveniste, and Kasami by using the features, as taught by Chang, in order to provide a transmitting method for an OFDM system using at least one antenna (Chang: see page 1, section 0010).

Allowable Subject Matter

14. Claims 11, 12, 15, and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 11, the wireless packet communication method according to any one of claims 1-5, characterized in that:

when a number K of transmission-standby data frames exceeds the number N of idle channels,

said STA waits until a relationship $N \geq K$ is satisfied, all radio channels become idle before said relationship $N \geq K$ is satisfied, a prescribed time elapses before said

relationship N ≥ K is satisfied, or the number or a data size of transmission-standby data frames reaches a prescribed value before said relationship N ≥ K is satisfied; and then

generates and simultaneously transmits data packets in a number according to the number of idle radio channels.

Regarding claim 12, the wireless packet communication method according to any one of claims 1-5, characterized in that:

when a number K of transmission-standby data frames is smaller than a number N of idle channels,

said STA waits until a relationship N = K is satisfied, a prescribed time elapses before said relationship N = K is satisfied, or the number or a data size of transmission-standby data frames reaches a prescribed value before said relationship N = K is satisfied; and then

generates and simultaneously transmits plural data packets.

Regarding claim 15, the wireless packet communication method according to claim 7, characterized in that:

when a number K of transmission-standby data frames exceeds a number of simultaneous transmissions T, the number of simultaneous transmissions T being said sum of said MIMO numbers of said plural respective radio channels,

said STA waits until a relationship T ≥ K is satisfied, all radio channels become idle before said relationship T ≥ K is satisfied, a prescribed time elapses before said

relationship T _> K is satisfied, or a number or a data size of transmission-standby data frames reaches a prescribed value before said relationship T ≥ K is satisfied; and then

said STA generates and simultaneously transmits data packets in a number according to the number of simultaneous transmissions.

Regarding claim 16, the wireless packet communication method according to claim 7, characterized in that:

when a number K of transmission-standby data frames is smaller than a number of simultaneous transmissions T, the number of simultaneous transmissions T being said sum of said MIMO numbers of said plural respective radio channels,

said STA waits until a relationship T = K is satisfied, a prescribed time elapses before said relationship T = K is satisfied, or a number or a data size of transmission-standby data frames reaches a prescribed value before said relationship T = K is satisfied; and then

said STA generates and simultaneously transmits plural data packets.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUVENA LOO whose telephone number is (571)270-1974. The examiner can normally be reached on Monday - Friday: 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUVENA LOO/
Examiner
Art Unit 2416
March 01, 2009

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2416